

EXECUTIVE SUMMARY

This report on Federal Energy Management for Fiscal Year (FY) 1996 provides information on energy consumption in Federal buildings, operations, and vehicles and equipment, and documents activities conducted by Federal agencies to meet the statutory requirements of Title V, Part 3, of the National Energy Conservation Policy Act (NECPA), as amended, 42 U.S.C. §§ 8251-8259, 8262, 8262b-k, and Title VIII of NECPA, 42 U.S.C. § 8287-8287c. This report also describes the energy conservation and management activities of the Federal Government under the authorization of section 381 of the Energy Policy and Conservation Act (EPCA), as amended, 42 U.S.C. § 6361. Implementation activities undertaken during FY 1996 by the Federal agencies under the Energy Policy Act of 1992 (EPACT), Executive Order 12759 on Federal Energy Management, and Executive Order 12902, Energy Efficiency and Water Conservation at Federal Facilities, are also discussed in this report.

Based on reports submitted to the Department of Energy (DOE) by 30 Federal agencies, the total gross energy consumption of the Government of the United States, including energy consumed to produce, process, and transport energy, was 1.56 quadrillion British Thermal Units (quads) during FY 1996.¹ These 1.56 quads consumed by the Government in buildings and operations to provide essential services to its citizens, including the defense of the Nation, represent approximately 1.7 percent of the total 89.81 quads² used in the United States. In total, the Federal Government is the single largest energy consumer in the Nation, although its pattern of consumption is widely dispersed.

The Government consumed 1.11 quads during FY 1996 when measured in terms of energy actually delivered to the point of use (net energy consumption). Unless otherwise noted, this report uses the site-measured conversion factors for electricity and steam. The total net energy consumption in FY 1996 decreased 23.4 percent from the FY 1985 base year. This reduction of 338.0 trillion Btu could satisfy the energy needs of the State of Idaho for more than one year.³

The total cost of the 1.11 quads was approximately \$7.7 billion in FY 1996.⁴ This is \$2.7 billion less than the \$10.5 billion reported in FY 1985, a 26.5 percent⁵ decrease in nominal costs. This decrease reflects the 23.4 percent reduction in energy use combined with a 4.0 percent reduction in energy prices. In constant 1996 dollars, this equates to a decrease of 47.4 percent from \$14.6

¹Gross energy consumption considers all resources used to generate and transport electricity and steam. Tables 1-A, 4-A, and 7-B show gross energy consumption for comparison with net consumption. Conversion factors of 11,600 Btu per kilowatt hour for electricity and 1,390 Btu per pound of steam are used to calculate gross energy consumption.

²DOE/EIA-0035(97/05), *Monthly Energy Review*, May 1997.

³Based on net energy consumption estimates for 1994 in the residential, commercial, industrial, and transportation sectors (299.8 trillion Btu). Source: DOE/EIA-0214(94), *State Energy Data Report, 1994*, Tables 4, 5, 6, and 7; October 1996.

⁴All costs cited in this report are in constant 1996 dollars, calculated using Gross Domestic Product price deflators. See DOE/EIA-0384(96), *Annual Energy Review 1996*, Appendix D; July 1997. Costs noted as nominal dollars reflect the price paid at the time of the transaction and have not been adjusted to remove the effect of changes in the spending power of the dollar.

⁵Calculation of percent changes does not account for rounding of numbers in text.

billion in FY 1985 to \$7.7 billion in FY 1996. This decrease reflects the reduced energy use combined with the 31.4 percent reduction in inflation-adjusted energy prices. The Federal energy bill for FY 1996 decreased \$105.7 million from \$7.8 billion constant dollars spent in FY 1995.

Federal agencies report energy consumption under three categories: buildings and facilities, energy intensive operations, and vehicles and equipment.

Buildings and Facilities

In FY 1996, the Federal Government used 358.5 trillion British Thermal Units (Btu) to provide energy to approximately 500,000 buildings and facilities. This consumption represents an 24.0 percent decrease compared to FY 1985 and a 2.2 percent decrease relative to FY 1995. The cost of energy for buildings and facilities in FY 1996 was \$3.6 billion, a decrease of approximately \$76.4 million from FY 1995 expenditures, and a decrease of 35.0 percent from the FY 1985 expenditure of almost \$5.6 billion in constant dollars.⁶

During FY 1996, Federal agencies had three primary options for financing energy efficiency, water conservation, and renewable energy projects in buildings and facilities: direct appropriated funding, energy savings performance (ESP) contracts, and utility-sponsored demand side management (DSM) incentives. Funding from the three sources totaled approximately \$193.6 million in FY 1996. Direct appropriations accounted for approximately \$179.2 million. ESP contracts awarded in FY 1996 resulted in \$2.4 million in known contractor investment and agencies reported \$12 million in DSM incentives received.

In FY 1996, direct appropriated funding identified by agencies for energy conservation retrofits and capital equipment decreased 37.8 percent from \$288.3 million nominal dollars in FY 1995 to \$179.2 million. FY 1997 funding is projected at \$144.4 million based upon reports from the agencies, a 19.4 percent decrease from FY 1996. If this trend continues, agencies may face difficulties in meeting mandated reduction goals for 2000 and 2005.

Energy Intensive Operations

The energy intensive operations category covers energy used in buildings excluded from the 10 and 20 percent reduction goals for buildings and facilities under section 543 of NECPA, 42 U.S.C. §§ 8253(a)(2) and 8253(c). This category includes the energy consumed in industrial operations, certain research and development activities, and electronics-intensive facilities.

In FY 1996, the Federal Government used 74.1 trillion Btu of energy in energy intensive operations, approximately 6.7 percent of the total 1.11 quads consumed. Total energy consumption in this category increased 86.6 percent relative to FY 1985 and decreased 2.2 percent relative to FY 1995. This increase is the result of changes in reporting procedures by individual agencies as well as changes in agency missions.

⁶Cost and consumption figures for FY 1985 may be different from those published in last year's Annual Report since Federal agencies update their files and provide revisions to their data.

The Federal Government spent \$635.8 million on energy intensive operations energy in FY 1996, \$34.2 million more than the FY 1995 expenditure of \$601.5 million constant dollars.

Vehicles and Equipment

The vehicles and equipment category includes aircraft and naval fuels, automotive gasoline and diesel fuel consumed by Federally-owned and leased vehicles and privately-owned vehicles used for official business, and the energy used in Federal construction.

In FY 1996, the Federal Government used approximately 675.1 trillion Btu of energy in vehicles and equipment, approximately 60.9 percent of the total 1.11 quads consumed. Total energy consumption in vehicles and equipment decreased 27.7 percent relative to FY 1985 and 1.7 percent relative to FY 1995. The Department of Defense consumed 631.2 trillion Btu or 93.5 percent of all vehicles and equipment energy used by the Federal Government.

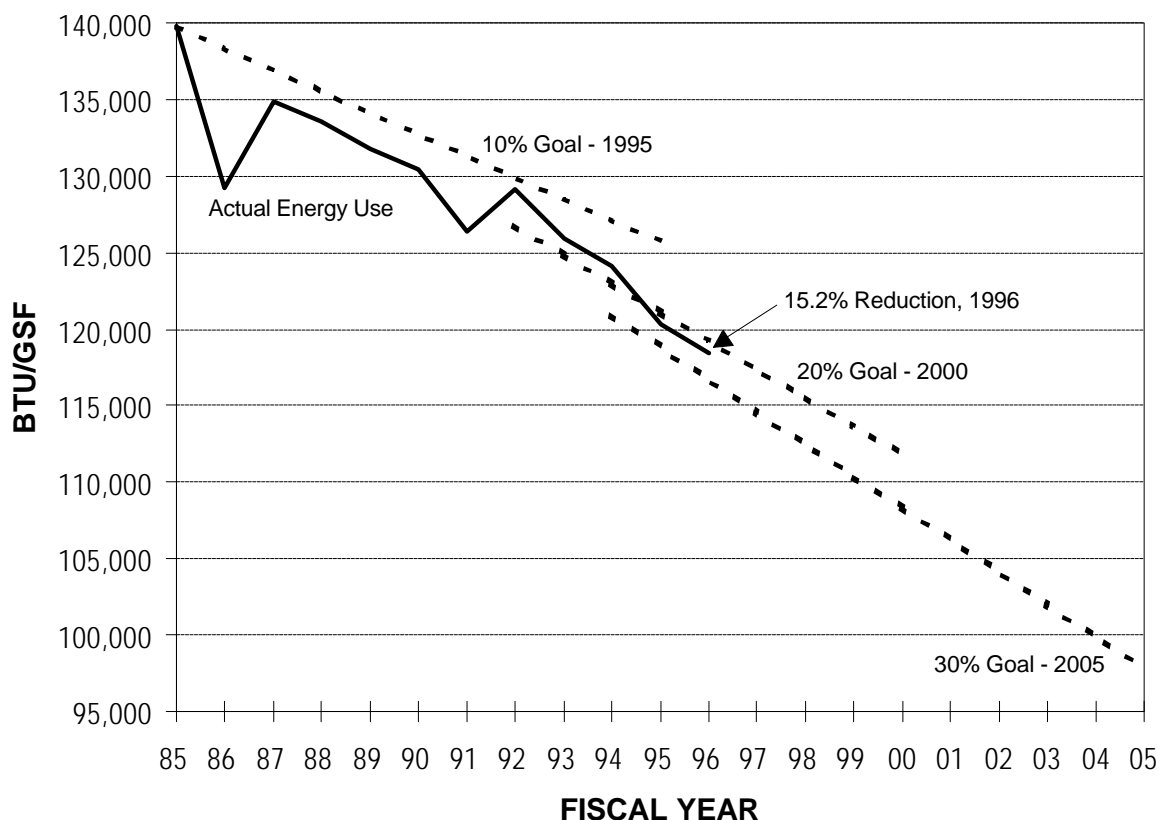
The Federal Government spent approximately \$3.4 billion on vehicles and equipment energy in FY 1996, \$63.6 million less than the FY 1995 expenditure.

During FY 1996, the General Services Administration Automotive Center procured 1,541 alternative fuel vehicles (AFVs) for lease and sale to other Federal agencies.

Agency Progress in Meeting Energy Reduction Goals

NECPA, as amended by EPACT, requires agencies to take the steps necessary to reduce energy consumption in Federal buildings by 10 percent by 1995 compared to 1985 consumption levels, based on Btu per gross square foot and requires a 20 percent reduction by 2000 compared to 1985 consumption levels. The 10 percent goal was met by the Government in FY 1995 with a 13.9 percent reduction from FY 1985. Executive Order 12902 adds an additional goal of reducing energy consumption by 30 percent by the year 2005 relative to 1985 consumption levels. During FY 1996 agencies provided data to DOE that indicated a decrease in energy consumption per gross square foot by 15.2 percent relative to FY 1985. The Government's performance for each year since FY 1985 is illustrated in Figure ES-1. This reduction was the result of significant decreases in the consumption of fuel oil, natural gas, and coal. Although the use of non-electric fuels in Federal buildings has declined approximately 36.0 percent since 1985, the consumption of electricity has increased approximately 3.1 percent. The increase in electricity may result from the installation and increased use of electricity-driven electronic equipment. Electricity now represents about 73.1 percent of the total energy costs of Federal buildings and accounts for 41.6 percent of total net energy consumption in buildings. This is compared to 30.7 percent of the total energy consumption in buildings in FY 1985.

FIGURE ES-1
Decrease in Btu per Gross Square Foot
in Federal Buildings and Facilities from FY 1985



Agency efforts undertaken in FY 1996 to increase energy efficiency in buildings included:

- improvement of operations and maintenance procedures;
- implementation of no-cost, low-cost efficiency measures;
- energy-efficient building retrofits and capital improvements;
- energy awareness activities and employee training programs; and
- procurement of energy-efficient goods and products.

Executive Order 12902 expands the scope of Federal energy management activities beyond the NECPA mandates by establishing goals for industrial facilities. Section 301(b) of Executive Order 12902 requires agencies to implement programs in industrial facilities to increase energy efficiency by at least 20 percent in FY 2005 in comparison to FY 1990 consumption levels to the extent that measures undertaken to achieve the goal are cost-effective.

Procurement of Energy-Efficient Products

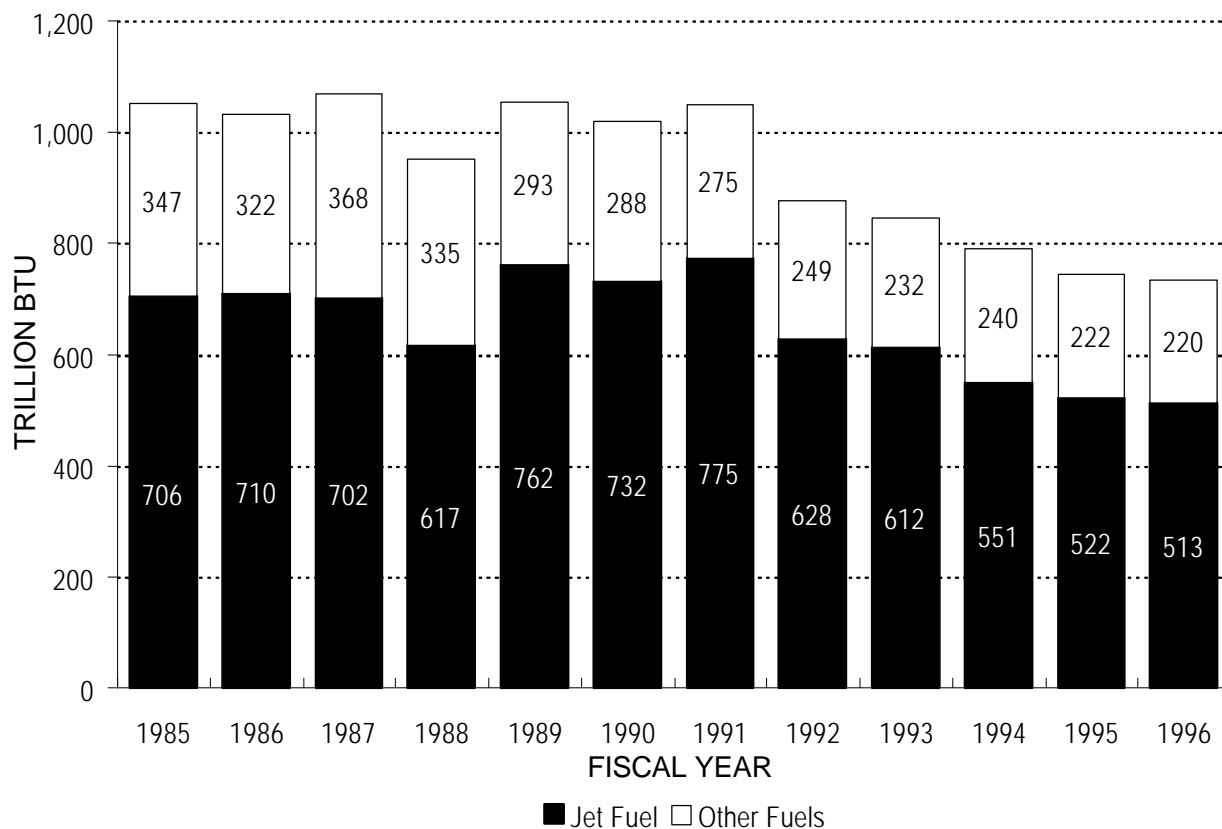
Section 507 of Executive Order 12902 requires all Federal agencies to buy “best practice” products, when practicable, when they meet the agency’s specific performance requirements, and are cost-effective. Best practice products are those which are in the upper 25 percent of energy

efficiency for all similar products, or products that are at least 10 percent more efficient than the minimum level that meets Federal standards. During FY 1996, DOE continued its program to assist agencies in implementing the EPACT and Executive Order requirements for energy efficient procurement.

Reducing Petroleum-Based Fuel Consumption

Effective management of energy resources is of strategic importance to the Federal Government as well as the Nation. In FY 1996, petroleum-based fuels accounted for 0.73 quads of the total 1.11 quads consumed by the Federal Government with 0.68 quads used by the Department of Defense primarily for jet fuel and distillate/diesel for vehicles and equipment. The Government consumed 30.3 percent less petroleum-based fuel in FY 1996 than in FY 1985. Figure ES-2 illustrates the trend in the Government's use of petroleum fuels.

FIGURE ES-2
Federal Consumption of Petroleum-Based Fuels
FY 1985 through FY 1996



Due to the strategic nature of petroleum-based fuels, section 305 of Executive Order 12902 directs agencies to minimize the use of petroleum-based fuels in buildings and facilities. Federal agencies have made significant progress in reducing their dependence on petroleum-based fuels in their buildings and facilities. For example, Federal agencies report that in FY 1996, 52.1 trillion Btu of petroleum-based fuels were used for buildings and facilities energy, a 53.1 percent

decrease from FY 1985 and a 0.6 percent increase from FY 1995. This represents 14.5 percent of total buildings and facilities energy consumption.

Federal Energy Management Highlights

Progress is being made in increasing Federal energy efficiency, although there remain opportunities for greater efficiency and cost reduction. Several of the most important findings of this report are listed below:

- The overall real cost of energy consumption in the Federal Government has fallen from \$14.6 billion in FY 1985 to \$7.7 billion in FY 1996.
- Total net energy consumption in FY 1996 decreased 23.4 percent from FY 1985.
- Energy consumption in buildings in FY 1996 decreased 24.0 percent from FY 1985.
- On a Btu-per-gross-square-foot basis, the 15.2 percent reduction in buildings energy puts the Federal Government on track to meet the 20 percent reduction goal for 2000.
- Six agencies, the Departments of Agriculture, Commerce, Energy, the Interior, and Justice, and the National Aeronautics and Space Administration have surpassed a 20 percent reduction in buildings energy use per gross square foot from 1985.
- Energy consumption in FY 1996 was used for the following purposes:

<i>End Use</i>	<i>Percentage</i>	<i>Cost</i>
Buildings & Facilities	32.4 percent	\$3.6 billion
Energy Intensive Operations	6.7 percent	\$0.6 billion
Vehicles & Equipment	60.9 percent	\$3.4 billion